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RAPID INTENSIFICATION.

JULIUS F. SACHSE.

RENEWED attention has of late been given to the subject of intensification of gelatine negatives, especial stress being laid upon the alleged advantages of a modified sulphite process, on account of the rapidity with which it can be accomplished, as a careful and prolonged washing is not absolutely necessary. Another great advantage claimed being an absolute immunity from veil or stain, and that any degree of density can be obtained without affecting the clearness and brightness of the shadows.

During the past summer the writer had a series of about one hundred plates to intensify, in the course of which most all of the various reducing agents used after mercuric chloride were tried. This test ended with the conviction that the usual 1:10 ammonia solution, preceded by a bath of

Chloride ammonium - - - - -	½ oz.
Water - - - - - - -	20 ozs.

was the surest and best reducing agent for gelatine plates treated with mercuric chloride, where strong contrasts were required, such as manuscripts, drawings, etc.

Where the bleaching process was followed by the usual alkali solution, as used with the pyro developer,

Sulphite of soda - - - - - -	3 ozs.
Carbonate of soda - - - - -	3 ozs.
Water - - - - - - - - -	20 ozs.

the result with "black and white" subjects was rather a change in color than an increase in density, but for landscape, portrait, or architectural subjects gave better printing results than ammonia.

Coming to the so-called "rapid" intensifiers which are now heralded as the ideal intensifiers, as they are supposed to dispense with the final washing, our experience was not favorable to the recommended solutions. First, amidol was tried in the usual advertised formula:

Amidol - - - - - - -	1 part.
Sulphite - - - - - -	10 parts.
Water - - - - - - -	100 parts.

The results were not so dense as those obtained with ammonia, nor as good printers as produced with sulphite and soda. Further, the plates seemed to come up uneven in density, and when prolonged, a metallic film formed on the surface. Plates to be treated with the amidol solution required much more careful washing, and even then seemed to be denser around the edges than towards the centre.

Sulphite and metol, which is now so much praised in the photographic press, failed to give the desired density. The formula used was:

Metol - - - - - - - -	15 grs.
Sulphite of soda - - - - -	3 drs.
Water - - - - - - -	10 ozs.

The reduction proceeded much slower than with ammonia; the color of the negatives was a blueish black. An addition to above solution of

Hydrochinone - - - - - -	5 grs.

gave more density, but in our hands did not come up to the dilute ammonia and clearing bath as above given.

In connection with the "rapid" metol reducer, there is another important factor to be taken into consideration,—the poisonous nature of both solutions. Almost every photographer is aware of the poisonous nature of mercuric chloride, and the extreme

care necessary with its use. Word has lately come from Europe of the equally poisonous nature of the metol solution; both solutions are clear and colorless. Pour one into the other, and no change whatever take place in appearance; it remains a clear, colorless liquid. With ammonia, to the contrary, a single drop poured into the dilute solution of the mercuric chloride will immediately tell the poisonous nature of the liquid. One solution counteracts or precipitates the other.

With the metol solution it is different. Here we have two poisonous substances, both liable to be absorbed by the skin of the operator, thus subjecting the photographer to a risk for which in our experience there is really no justification, as the results obtained and the time saved in the final washing is really too small to be of any account.

Another matter to be mentioned in connection with the sulphite, metol, and amidol process, is that in our practice they fail to work equally well with different makes of dry plates. While working fairly well with some brands of plates, others were hopelessly ruined. This, of course, alludes only to their use as an intensifier.

Notwithstanding the glowing accounts of the advantages offered by the new medium, the alkaline solution of sulphite and soda still continues the safest where but medium density is required, but for all-round work dilute ammonia is still the reducer to be depended upon.

The Bruce Photographic Telescope, which has so long been in process of construction at Alvan Clark & Son's, Cambridgeport, will soon be set up at the Cambridge Observatory, and will probably be in operation in the course of a month. Its completion will mark a new epoch in this branch of science, as it is the largest and is thought to be the most powerful instrument of its kind which has yet been set up. The base and operating machinery are already in place at Cambridge, and the tube and lenses, although still at Clark's works, are practically completed. It is expected that with this instrument stars can be photographed which have never been seen through the most powerful visual telescope.

LINEAR PERSPECTIVE.

XANTHUS SMITH.

ALTHOUGH it is not necessary for photographers to learn the rules of perspective, because the lens takes full care of this matter for them, a photograph invariably being correct in its perspective, yet a few of the leading principles of this subject might not be without interest to some of our readers.

Perspective is a simple enough subject, and yet it is one which is often very much misunderstood, even by those whom, it might be supposed, would be, or should be, well versed in it. We see in the works of many artists, even those of the highest reputation, sad blunders in the management of their perspective. But this probably is often as much due to carelessness or the lack of a vigorous determination to have their work correct as to absence of knowledge of the subject.

Certain it is, however, that there is nothing more offensive to any one possessing a well trained eye than a violation of the laws of perspective in a picture. It is one of nature's undevisable laws that objects diminish in size to our perceptions as they recede from us, and always according to a fixed ratio or system. In looking at any object there is a point of sight and a vanishing point. The point of sight is the position of the eyes of the individual beholding the object, and the vanishing point is the point to which the lines of the object diverge. The vanishing point is always upon the horizon. The exact position on the horizon is determined by the position of the object relatively, right or left, or as it is more facing or more oblique to the observer.

A fixed law is that the horizon is always level and always parallel to the line of vision. Because we are upon a sphere, and no matter how we turn the termination of our line of vision is the same in every direction, forming an endless circuit. If we are looking at the side of a sloping mountain, this is not the horizon line, although it may form the limit of our view against the sky; for if we turn about the outline soon terminates toward the true horizon.

Another fixed law is that in determining the perspective of a subject the head of the observer must be held precisely in one position. The moment it is moved the least fraction to the right or left, the vanishing point upon the horizon changes its position.

As I am not able to accompany my remarks by outlines by way of demonstration, it must be left to the reader to demonstrate the text for himself by going to a position where he will have a view of the horizon or an approach to it, and getting a friend to hold up a chair some ten feet from him, so that it may be brought to intersect the horizon. When the chair is upon the floor before raising it, the top of the seat will appear in its full dimensions, as the chair is raised the surface will become diminished, and will disappear altogether just at the moment when the seat of the chair is passing the horizon. Then as the chair goes on up the underside of the seat will begin to appear, and will increase its displayed surface until just as much of the bottom is seen as was shown of the top when on the floor, which will be when a point is reached equal in height above the eye to that below the eye when resting upon the floor. The seat of the chair must be kept level. As in the case of the chair so it is with all objects,—a man, a house, it matters not what,—when below the horizon we see upon top of them, when above we see underneath them. It is of course patent enough to every one that when above a thing we see on top of it or into it, and when below we see the under-part, but the association of this rule with the horizon is not common, and it is by the knowledge of this law that the artist determines correctly the true relative height of and amount of upper or under surface of everything appearing in his picture.

If all objects were round the subject of perception would be very much simplified, because in the case of a round object or column, it matters not how we move it from side to side, or move our heads relatively to it. It will always appear the same. But when we come to deal with objects that are square or parallelograms, the moment we change the position of them laterally or change the position of our heads we see more of one side and less of another. With a square object we never can see more than two sides at once. We may put it in a position, or put our-

selves in a position relatively to it, so that we can only see one side, that which is facing us, and in this position this face will be precisely at right angles to the line of vision toward the horizon, or parallel with the horizon. The moment we turn the object or change our own point of view we see either one side or the other of the object in addition to its face, and neither faces are any longer at right angles to the line of vision. That face which we see the most of will be most oblique, and that which we see the least of most acute to the line of vision.

Place any thick book on a table somewhat below the level of the eye, which will be below the level of the horizon, and turn it about. It will be found that the top and bottom lines of the end and back of the book are not parallel: when the corner of the book is toward the eye, they will converge,—that is, the book will appear narrower at the farther end. These lines if carried out will come together at a certain point on the horizon on both sides. These are the vanishing points. In a picture these points may be within the boundaries of the picture or beyond it. If the book be placed with the back very much towards us and the end but little seen, the vanishing point for the back will be beyond the boundaries of the picture and those of the end within it.

There is no plan so good for rapidly determining the direction of the lines of objects about us as to hold up a ruler, or pencil even, level in front of the eyes, and bring it intervening to what we would judge of. Take a ruler, and seating yourself any where in an apartment, hold it up perfectly level and at right angles to the line of vision in front of the eyes. It will be more clearly demonstrated by using one eye, and bringing the vision to bear over the edge, compare the direction of the lines of the walls of the apartment and those of the various objects in the room with that of the edge of the ruler, and you will perceive at once how they go pitching up and down. It will be observed that all those lines which are upon a level with the eye run parallel with the ruler, whilst all those above drop down and those beneath rise up, and the higher, the lines of the cornice for instance, drop the most, whilst those which are the lowest, as the washboard and bases of objects resting on the floor, rise up most,—except in the case of

all objects which directly face us, that is, present a front parallel with the plane of vision, which will show their lines corresponding to the direction of the ruler.

Those objects which are nearest to us will show the greatest pitch of lines, and those that are furthest the least.

In drawing or photographing objects which pretend to beauty, it is never well to choose a very close point of view, if such can be avoided, the rapid convergence of the lines having an unpleasant effect upon the eye. This effect is called distortion, and is violently brought out by the use of wide-angle lenses which admit of the closest possible point of view. Painters in designing those scenes which are very closely hemmed in choose an imaginary point of view, and arrange their perspective accordingly, so that the whole appears as if viewed from a distance sufficient to give a more agreeable presentment.

It is well, as we said at the outset, that photographers have all this matter of perspective taken off their hands. Their art being semi-mechanical their perspective is rendered for them with that accuracy with which nature does many things. And in the rendering of a scene with a great number of buildings all placed at different angles, and in those apartment views containing a large number of objects standing in every imaginary position, they are saved an immense deal of work which falls upon the artist who is compelled to find the true vanishing point of every line in his picture.

It will form a matter of curious interest to any photographer, who may not have already done so, to take a photograph of any pretty well-filled apartment, and laying a ruler upon it, see not only how many vanishing points there are for the different objects, but also how precisely the lines of structure of each object will come together at the proper point, when determined by carrying out any one of them and following with the others to the horizontal vanishing point. There is something really beautiful in taking a photographic view of a fine architectural interior, in which there is great intricacy of design, and proving the perspective. The horizontal line will immediately be found from all lines being level at this point, and it will be just where, if the

structure were of glass and we could see out, or if there is a window to look out of, we will see the horizon, and if the photograph be secured upon a long table and a line carried out several feet upon each side of it, the upper and lower lines of structure and features will all converge to certain points upon this horizon line. The horizon line will hold the same relative position to the eye if the apartment spoken of were at the top of a high building as it would if it were at the base, because as we ascend the horizon always goes up, and as we descend it goes down. When standing close to the water at the seashore we have a very low horizon, and all objects of any importance appear to tower above it, whereas on ascending a lighthouse if it be a high one, our horizon will rise to the level of our eye, and we will have an uninterrupted circuit, all surrounding objects appearing away beneath us.

An Important Decision.—A recent decision handed down by one of the courts, and of interest to both professionals and amateurs, is as follows: "A photographer who poses and makes an artistic picture of a sitter, becomes the author of an original work of art, the product of his intellectual invention, and is entitled to copyright the photograph upon complying with the provisions of the act of Congress for the obtaining of copyrights. The use of a picture so copyrighted as the basis of a lithograph or cut constitutes an infringement if the design of the photographer be so far copied as to appropriate his manifestation of his conception, or a substantial part thereof." The importance of this decision to photographers in deciding a long-mooted question is very great, and its effect upon the trade cannot be otherwise than beneficial.—*Brooklyn Standard Union.*

An Artist.—"Where have you been, Frank?"

"Down at St. Louis."

"What were you doing there?"

"I ran a photograph gallery."

"Did you get anything to do?"

"Well, I should say I did. I put out a sign, 'Babies taken here,' and next morning there were four of them left on the door-step."

ELEMENTARY STEREOGRAPHY.*

BY THOMAS BEDDING.

A CORRECTLY prepared stereoscopic slide or transparency, when examined in the stereoscope, shows us the original view with all the realism that invested it at the moment we exposed our plate upon it. Stereoscopic pictures, binocularly observed, take us one step further than does the faculty of memory. The latter recalls to the mental gaze scenes invisible to the material eye; the former recreate, if not the veritable scenes themselves, at least transcriptions of them, perfect in all respects but two, namely, movement and color. Atmosphere, distance, solidity, height, depth, and breadth, are more than merely suggested in stereographs; to the eye, or rather to the brain, they appear as though they were really present in them. No single or monocular photograph, however skilful or cunning in the management of its lights and shadows, suggests more than a faint similitude of the attributes of actuality I have enumerated. The æsthetic beauty of good stereographs is inferior to that of Nature herself alone. Their fidelity to that original can be scientifically demonstrated, and yet, while they allow little rein to the fads and freaks of your modern photographic impressionists, they are nevertheless artistic, as most of us understand that indefinable, yet easily realizable term. The delight at viewing stereographs is so genuine and lasting, they are so easily prepared, and the educational advantages of stereography are so considerable, that there is room for wonder at the comparatively few photographers who practice it. Stereography is an art within an art, and it is readily acquired by anybody having an ordinary acquaintance with monocular photography. I have called it a thing of beauty. That it is a joy for ever, that its fascinations are of an enduring nature, may be proved by broaching the topic to most veteran photographers. The deep affection they retain for binocular work, their regret at its decadence, their pleasure at its resuscitation, can only be understood by stereographers.

* Read before the North Middlesex Photographic Society.

SOME MISTAKEN IDEAS.—I have been extremely surprised, and just as much amused, at the large number of photographers —professional and amateur, veterans and novices—who are ignorant of the fundamentals of stereography, and whose ignorance leads them into all kinds of blunders when they come to talk or write of it. The supposition that stereoscopic effect is obtainable from two similar pictures is a common fallacy, and quite recently has formed the groundwork of articles and papers by people posing as teachers of their subject. As two dissimilar pictures are necessary to obtain stereoscopic effect, the absurdity is manifest. The other day, too, the novel property of "stereoscopicity of effect" was claimed for negatives on multiple-coated plates. Then, not long ago a writer of considerable scientific eminence said he had stood outside a shop window filled with monocular photographs, and, at a distance of several feet, saw them stereoscopically. Such a thing cannot be done by any mortal man. Consider: I am quoting photographic "authorities" who enjoy the profit and dignity attaching to that agreeable reputation. I can the more readily excuse the ignorance of a bystander (an amateur, I divined, by his conversation) who, when I was recently using a binocular camera in Norfolk, told a friend who was with him that the function of my two lenses was to "unite the two images in the camera;" but even he, like the supposedly better-informed gentleman I have quoted, had two eyes, and could not have known how, why, or what he saw with them.

STEREOGRAPHY IN A NUTSHELL.—For here—in the philosophy of eyesight, in binocular vision—lies the whole subject of stereography, ready, cut and dried, for assimilation by the meanest capacity. With our two eyes we see stereoscopically—that is, through them two dissimilar or unlike pictures of an object are carried to the brain, which combines them to form a third, which is what we think we see with the two eyes simultaneously. Now mark the analogy between the eyes and the sterescope. In the latter, two lenses are placed side by side to enable us at short focus to look at two dissimilar photographs,—that is, photographs taken from slightly different points of view,—and these pictures

are conveyed through the eyes to the brain, which combines them to form a third picture, having all the illusion of reality. That there are two points of view in binocular vision necessarily follows from the fact of the eyes being separated, but anybody can practically test the point for himself by using, first, the right eye alone, and then the left to look at a view or object, when it will be seen that the right eye takes in more of the right side of the view or object, and the left eye of the left side, while the picture seen, or supposed to be seen, by the two eyes differs from both the monocular pictures. Furthermore, the convergence of the optic axes upon near or distant objects enables us to appreciate solidity, relative size, and relative distance, and when looking through a stereoscope at two dissimilar photographs, convergence of the optic axes by refraction again comes into play to separate the planes of the subject, and to, in short, impart to the picture what I have already termed the realism of the original view or object.

Now, suppose a pair of lenses, mounted on a camera front, and separated by about the distance that separates the eyes, and a twin or binocular negative to be taken. The point of view of each lens was different, hence there must, in theory, be a dissimilarity in the two pictures, just as we have seen that there is in the two pictures, just as we have seen that there is in the two pictures seen by the two eyes. Practice agrees with theory in this. The right-hand negative has more of the right side of the picture than the left-hand negative has, and the left-hand negative has more of the left-hand side of the picture than the right-hand negative; and where the two negatives are joined the amount of subject included on those sides is severally less than that on the corresponding sides. Prints from such negatives having the same relation in the matter of right and left, and inclusion of subject as the double view as seen by the two lenses had, fulfil every condition necessary for binocular examination. Put it in another way. Imagine the lenses to be your eyes. They saw two dissimilar pictures of the view, and your positive prints are, practically, what your eyes or your lenses saw. The stereoscope lets you see the two views under the same angular

conditions as they were taken, the result is a coalescence of the dissimilar results in the brain, and Nature herself over again, a perfect *facsimile* in miniature.

THE STEREOSCOPIC CAMERA AND LENSES. — Although not essential to the production of binocular pictures, I shall assume the use of a binocuiar camera in stereography—that is, a camera fitted with a pair of lenses and a collapsible division extending from back to front, and virtually making two cameras of one. The lenses must be accurately paired as regards focus and diaphragms. For most kinds of work single lenses are employed, although rectilinear doublets have an advantage in the matter of extra rapidity and for short-focus work in giving freedom from distortion. A focal length of five inches will be most convenient; but for confined subjects a dair of wide-angle doublets, of about four inches focus, and for distant objects a pair of singles, of, say, seven inches, are desirable. Beyond that focal length it is seldom desirable to go, and I shall show you later that the occasions when even a pair of seven inches would be found serviceable are not frequent in the course of ordinary work. I do not wish to dogmatize on the debated point as to the distance of separation of the lenses when mounted on the camera front, but, from my own experience, would recommend three inches from centre to centre. The acme of convenience is, of course, gained by having the power of adjusting the lenses to suit near and distant objects, the rule to follow being, the nearer the object the less the separation, and the more distant the object the greater the separation. Three inches, however, will be found to strike a happy mean, and will obviate exaggeration of relief in most subjects. It need hardly be said that such a shutter must be used as will allow of simultaneous exposure of the two halves of the negative. Some photographers use a double cap.

A camera of the old-fashioned square bellows form is necessary, with an extra front for the twin lenses, and the collapsible septum already spoken of. A half-plate or larger camera is a stereoscopic camera *per se*, and can be converted for practical use at a small cost. As to size, I do not recommend anything larger than 7½ by 5, or 8 by 5; using whole-plates and upwards

for binocular work is a waste of plate area, and renders contact work, either for lantern slides or stereoscopic transparencies, out of the question if one wishes to have choice of the whole of the subject. Briefly, anything larger than half-plate is unnecessary, and has its drawbacks.

Mention of the camera gives me an opportunity of condemning the, it is to be feared, still existent mania for taper-bellows cameras. These, perhaps, have some slight advantage in lightness, but often put a barrier in the way of the effective use of the rising and sliding fronts, and are useless for stereoscopic purposes. For these and other reasons I would strongly recommend the beginner to procure a camera of the square form. Many of my friends lament having sacrificed so much for the privilege of knocking off an ounce or two's weight. Up to about ten or dozen years ago, such makers as Lane, Meagher, Spicer, and others, always sent out their square-form cameras, with a detachable elastic division, to be used for binocular work. In those times, however, the division was rarely, if ever, required, stereography being virtually a dead letter, and I remember that, in the establishment of a well-known firm with whom I was then connected, there was quite an accumulation of these useless divisions. By-and-by, the makers ceased sending them out altogether.

Selection of Subject.—As this is a branch of stereography upon which little has been written, I enter upon it with peculiar pleasure. Most subjects are suitable for binocular treatment. In exercising the faculty of selection, a safe rule for the young stereographer is to split up his subject into several planes, and to assume that, in the foreground, the middle distance, and the distance, some prominent object, or series of objects, is placed. Such a rule simplifies the selection of subject considerably. Ninety photographers out of a hundred working monocular cameras, would either despise or overlook subjects capable of producing the most charming effects in the stereoscope. Conceive a bank of reeds in your foreground, a stream of water, with a gnarled tree overhanging it, a distance of shelving bank studded with brake and bramble—each of us can recall dozens

of such rural vignettes, but most of us would not think them worth a plate in the monocular camera. Yet how entrancing and riveting in its realism, how astonishing to note each nodding reed standing out like life itself, each bough, twig, and branch solid and round against the sky, the liquid transparency of the water, the wonderful effect of distance, in this simple picture when binocularly treated, and how one is tempted to stretch out one's hand—to look behind the picture as it were—to grasp the substance of what, after all, is only a shadow? An old cottage behind a rustic gate, backed up with sheltering trees, a crazy bridge over a willow-lined river, shipping, most architectural subjects, interiors, tree studies, flowers, statuary, portraiture—all pay for binocular treatment. Nevertheless, open landscapes and seascapes, and subjects on one plane, however truthfully rendered, fail in binocular effect—indeed, long-focus work generally is scarcely satisfactory, and in that category possibly come instantaneous views of rapidly moving objects, though street life, and scenes deriving animation from the presence of people and other animals, form capital subjects. Hand-camera studies of animated life always convey to me the negation of animation, but binocular hand-camera work gives me an idea of movement—of having a better approach to visual effect. Some binocular scenes of Plymouth, taken by Mr. Seaman during the late Convention, struck me as wonderfully successful in that respect. With a stand-camera it is not always possible to obtain such pictures, and therefore a hand-camera must be used. Hence I regard the stereoscopic hand-camera as the hand-camera of the future. It will be a valuable adjunct to stereography. I refrain from saying how much it will benefit its users physically and mentally, how much it will increase the rapidity of plates, sharpen our nerves, add to our weight and our banking account, assure artistic expression to all our pictures, and decrease the distance between us and the photographic millennium. For I do not, alas! make hand-cameras, do not sell them, have not a mandate to boom the hand-camera, and sing its praises on every conceivable occasion. Hence this silence.

Reverting, however, to selection of subject, it will, I think, be found that there are more subjects within the scope of the binocular camera than the monocular—that is, there are subjects which are worthless as single pictures which will repay binocular treatment. Of course, the ideal amateur should be ready for both kinds of pictures as occasion may arise.

STEREOGRAPHIC PRINTING.—Sterescopic negatives should be well exposed, and, if anything, incline toward softness, so that the prints may be without violent contrasts of light and shade, and too prominent high-lights printing out white. Indeed, flat-looking prints are preferable for binocular examination. I have a daughter aged eight. When she first saw some stereoscopic slides she thus summed up their principal charm and commonest defect, "They look quite real," she said; and of one of them, "Did it snow when you took that picture?" This snowiness is fatal to the best results, and, if unavoidable in the negative, should be obviated by a careful sunning down of all white patches in the prints. A surface paper is essential, as all rugosities are magnified in the stereoscope. Gelatine or collodion prints are preferable to albumen prints; enamelled bromide prints are also suitable. Tone is, of course, a matter of individual taste, but warm tones are, I think, more agreeable than cold ones, and contribute better to fidelity of effects.

We come now to a part of our subject which is very puzzling to the beginner; that is, the transposition, trimming, and mounting of the prints. Still, all difficulty vanishes if we consider for a moment what it is we desire to produce in our finished print. We have taken two pictures. The one taken with the right lens must come on the right side of our mount; the one taken with the left lens, on the left side of the mount. But in the print from our negative the two pictures occupy reverse positions, so that the print must be cut in two in order that the two halves may be made to change places. For the sake of brevity, I will summarise the procedure necessary.

1. Both prints must have an identical base-line.
2. Each print must be two and a half inches wide.

3. Three inches in height will be sufficient; a little more or less is immaterial.

4. Trim the prints so that on the left of the right-hand picture and the right side of the left-hand picture a little more of the subject is seen than on the other sides of the pictures. Or, to put it another way, the sides of the prints which come together in mounting should each show more of the subject than the outside sides. A difference of from one-sixteenth to an eighth of an inch is usually a sufficient margin.

5. Allow a space of from one-sixteenth to an eighth of an inch to separate the prints.

6. Trim by foreground objects, and let a distance of not more than three inches separate them.

Spots or other defects in one of the prints show in the combined image, but if one print be printed a little deeper than the other it is hardly appreciable.

STEREOSCOPIC TRANSPARENCIES. — We must concede that stereoscopic prints do not compare in beauty of effect with stereoscopic transparencies; but I do not go so far as some in counselling transparency-making alone, for in the preparation of prints one can graduate in the small niceties of stereography, and let them find ultimate expression in transparency work. Besides, sensitive paper is cheaper to learn on than glass plates. In actual practice, transparencies are easier to make than prints. What I have said of the desirable qualities of stereoscopic prints as compared with monocular prints applies, in a like degree, to binocular transparencies as compared with lantern slides. The ideal brilliancy, clearness, and transparency of the latter are not necessary; indeed, they are in the nature of drawbacks. Of the methods of making glass stereographs, commend me to that by copying in the camera. The following outline of a working method will supply such details as will enable an amateur to undertake stereoscopic transparency-making at a very small outlay of ingenuity and money. At the back of an open box, having a central partition, the negative is placed in a suitable holder, inverted as regards top and bottom, film-side out, and facing the light, which may be either direct or reflected. The

binocular camera used for the negative should be fixed to a rigid board, and register secured between negative and ground glass. The space between the objective and negative holder should preferably be covered in with opaque material. The two images, as seen on the ground glass, will not be inverted, and will be in their proper positions as regards left and right, and consequently will not need transposition. The same rules as to identity of base-line and inclusion of subject must be observed as with prints, but you will easily see that they are considerably simplified. I myself use a special camera for the purpose. When the transparency is developed and dried, it is masked and bound up in the usual way, and, being viewed through its glass support, is backed up with either plain or ground glass.

For viewing slides and transparencies, a stereoscope of the familiar Holmes form will be found convenient, but it is very seldom found made in accordance with theory, as it should be so adjusted as to allow of the separation of the lenses to suit degrees of separation found in the eyes of individuals.

The Stereoscopic Revival.—I quote this oft-used term only to anathematize it. It is time we heard the last of it, for stereography is well past the revival stage. For a long time anterior to 1887 it was virtually moribund, but in the *British Journal of Photographic* Almanac for 1887 appeared an article by the editor, which handled the subject in a succinct and instructive form, and was instrumental in rescuing stereography from neglect. Mr. Chadwick, of Manchester, subsequently devoted a great deal of attention to the subject. Some of his writings have been republished as "The Stereoscopic Manual," which, with the Almanac named, will tell a beginner all he need know at the outset. If he cares to dive into the profundities of the stereoscope and binocular vision, let him consult Brewster's *Stereoscope*. I conclude with a question. Why do not promoters of photographic exhibitions have classes for stereographs? A double end would be gained. Photographic exhibitions which stand sadly in need of novel attractions would possibly secure one, and stereography among amateurs would receive an encouraging fillip.

THE FIRST PHOTO-MECHANICAL REPRODUCTION.

PROF. S. R. KOEHLER, curator of the Section of Graphic Arts in the Smithsonian Institution, and director of the Museum of Fine Arts in Boston, Mass., questions our claim made in the AMERICAN JOURNAL OF PHOTOGRAPHY, October, 1892, that to Joseph Saxton, of Philadelphia, is due the honor of making the first practical photo-mechanical reproduction used on a printing press. He even goes so far as to deny that the Saxton specimen was a photo-mechanical reproduction in the accepted meaning of the term.

Prof. Koehler in his exhaustive paper states that "a photo-mechanical reproduction" is one for which the printing form has been made principally by the action of light, aided by etching, washing-out, etc., *without the intervention of the human hand* except for corrections, elimination of defects, etc.

The second requisite is that the printing should be done by mechanical means,—*i.e.*, on a press. This second requisite the Saxton vignette as a matter of course meets, as it is printed from an intaglio plate on a roller press.

Then Prof. Koehler goes on to state that the first requisite is not met. For even, he continues, "If the view of the mint should have been daguerreotyped on the metal block used by Gobrecht for the die, which is impossible, as the character of the view shows, it still would have had to be engraved or sunk by the human hand."

Now, notwithstanding above opinion by the eminent authority as above quoted, the writer still adheres to the original claim as made in the AMERICAN JOURNAL OF PHOTOGRAPHY, October, 1892, and subsequently repeated before the Franklin Institute. The facts of the case simply stated are: In 1841, Joseph Saxton, a well-known Philadelphia scientist, made a daguerreotype of the Philadelphia mint for the purpose of obtaining a printing plate for the title page of a book about to be issued. The daguerreotype was then placed in the battery, and an electrotype made of the original. This was then backed with soft

metal, and separated from the dagurreotype. Gobrecht, the engraver, then took this intaglio and strengthened certain parts with the graver so as to give the necessary relief. When completed, an electrotype was then taken from this corrected intaglio and backed, from which the plate was ruled, giving, as Eckfeldt, says in the text quoted, "a faithful and beautiful transcript of the original." As a matter of fact, there was perhaps much less handwork done on the first electrotype than there is on many a Goupil photogravure of the present day.

Further, this result was a practical plate, from which a large edition was printed. It may be of interest to state in connection with this subject that an electrotype portrait made from a daguerreotype may still be seen in the Gutekunst Rooms, 712 Arch Street, Philadelphia. It is dated 1853, and was made by Mr. F. Gutekunst, personally.

In view of above facts, the writer certainly thinks that in all fairness the objections to the first requisite are disposed of.

Prof. Koehler further states: "Leaving aside, however, the question as to the nature of the Saxton vignette, it is not true under any circumstances that it is 'the first photo-mechanical production,' made in the year 1841. Neciphore Niepce began his experiments looking to the making of printing plates,—*i.e.*, plates printable in a press, in the year 1813. There is still in existence a plate made by him from an engraving in the year 1824. This plate is preserved in the Museum at Châlon-sur-Marne, and an impression from it is on exhibition in the Section of Graphic Arts at the U. S. National Museum, Washington, D. C. It is but fair to state that there is a slight doubt as to the absolute correctness of this date, as Niepce de Victor says that his uncle obtained plates made after the fashion of the one in question, 'since 1827.' The difference, however, is only three years."

This claim in favor of Niepce is not a new one. The facts of the case are as follows: The impression alluded to is a portrait of Cardinal Georges d'Amboise, Minister of Louis XII. The plate from which the print was made is of block tin, and it is alleged was obtained as follows: The metal is said to have been

coated with a solution of asphalt and Dippel's oil (obtained by the dry distillation of bones). Upon the coated plate was laid Brict's engraving of the Cardinal, and after being printed in the sun it was fixed with a solvent, and then lightly etched with acetic acid. Afterwards it was sent to Lemaitre, a celebrated Parisian engraver, to have the lines engraved and deepened, so as to give it a printing character.

The strangest feature about this story is that no one knew anything about either plate or print until its disclosure after a lapse of forty years, by Isidore Niepce, a son of Nicephore Niepce, in a letter to Fouque, dated March 10th, 1867, who was then compiling his "La Vérité sur l'Invention de la Photographie" (Paris, 1867). (Vide, also, Dr. J. M. Eder, Handbuch, Halle a. s., 1891, pp. 109–114.)

There is certainly no comparison to be drawn between this alleged crude attempt of Nicephore Niepce, which, even if true, was of no commercial value, and the practical result obtained by Joseph Saxton, the Philadelphia scientist, in the earliest days of the dawn of photography.

JULIUS F. SACHSE.

PROTECTION TO THE EYES.

A PROMINENT oculist of Philadelphia at a late lecture gave his hearers some very sensible rules for preserving the eyes. The eminent specialist stated that sudden changes from darkness to brilliant light should be avoided. Drugs and stimulants which affect the nervous system should also be avoided. Reading must not be done when lying down, or when mentally and physically exhausted. When the eyes become tired by looking at objects near-by, rest them by looking at objects afar-off. Pay special attention to the hygiene of the body, for that which tends to the general health acts beneficially upon the eye. Up to forty years of age bathe the eyes twice daily with cold water. Do not depend upon your own judgment in selecting spectacles. Old persons should avoid reading by artificial light; be guarded as to diet, and

avoid sitting up late at night. After fifty bathe the eyes night, morning, and evening with water so hot that you wonder how you stand it; follow this up with cold water; that will make them glow with warmth. Do not give up in despair when you are informed that a cataract is developing; remember that in these days of advanced surgery it can be removed with little or no danger to vision. To these may be added the following rules derived from long experience: Never rub the eyes with the end of the finger or the knuckles, as there is nearly always some dust or some other dirt upon them. If an extraneous substance gets in the eye, hold the eye under water, and then wash it gently. If it is of a size probably perceptible, let some fellow-workman, who is used to this service, pick it out. He catches hold of the eyelid, turns it back, and quickly dislodges it. In every iron-foundry there is some man who can do this for other men, and it can be accomplished with great quickness. In printing-offices there are not many persons skilled in this way, and it is better to go to an oculist at once and pay two or three dollars for a minute's work than to lose a day's labor through it. Sore and inflamed eyes can be much helped by washing in salt water. If the eyes are bad, and the salt and water not available, wash the eyes with pure water the last thing before going to bed. Never, if there is any difficulty with them, attempt to read or examine anything before being up at least an hour. To most persons with impaired eyes one hour's exertion at night is more injurious than three hours by day. If very bad, all night reading or work should be stopped. Very brilliant light close at hand is injurious, and so is very faint light. Many very young people require spectacles, and it will frequently be found desirable to change those first selected after having been in use a year or two. Sometimes short-sighted persons between forty and fifty years of age will discover that they can see no longer to read proof or set small type with ease, although they can perceive objects in the distance the same as formerly. This is occasioned by the eyes having become less adjustable than before. A long-sighted man has a flat eye, and a short-sighted person has a round eye. The latter, therefore, uses concave glasses to make his eyes flatter,

and the former uses convex glasses to make his eyes rounder; but in youth the muscles of the eye being easily contracted, the eye-ball can adjust itself to various focuses within a certain limit. As age comes on, this power is to a certain extent lost, and two pairs of spectacles may be required, one for reading, and the other for objects at a great distance. When this condition of the eye occurs, it is altogether wrong to adhere to one kind of spectacles only. Pebbles are better for convex glasses than glass, as they are harder and more transparent, thus being less liable to be scratched, which is common in the centre of other lenses, the form occasioning this. There is no particular object in having pebbles for spectacles for short-sighted persons, as in the centre of each lens there is only a thin film of glass, perhaps not the sixth in thickness of the lenses used by some long-sighted persons. There being a hollow here, the face of the glass is not liable to be scratched. Spectacles should be wiped with some soft substance, preferably a piece of chamois, and this should be done often. When the eyes are much fatigued, and labor has ceased, it is frequently a relief to take off the spectacles. Eye-glasses are not so desirable as spectacles when either are to be worn for some time.

Detected by Photographs.—Says a Doylestown special of October 23d: New evidence connecting the negro, William Johnson, alias "Lilac," with the robbery of the mail bag containing $12,000 in checks and drafts was discovered yesterday. When arrested two photographs were found on his person, one of a white woman and the other of a child. These, he said, were friends of his in Philadelphia. Upon investigation, however, it transpires that one is a photograph of Mrs. John Bergstresser, of Pipersville, and the other of her child. These pictures had been mailed to relatives, and left this place in the bag stolen by Lilac on the 17th inst. from the mail car at the station here. This is considered the best evidence the authorities could get to convict the prisoner.

Emery powder will remove ordinary stains from ivory knife-handles.

A NIGHT AT THE LICK OBSERVATORY.

SIR EDWIN ARNOLD thus describes a night he spent at the famous observatory founded by James Lick, near San Francisco:

Never shall I forget that memorable night! It was not that the huge armament of science revealed so much that was new to me, as to hear the rich and deep astral wisdom of those learned astronomers, with the great glass under our touch to illustrate each starry lesson. Like a 110-ton gun to look at—but, ah! how different in purpose and service—the colossal instrument reposed under our hands, peering broadly through the black embrasure of the slit in the cupola, obedient to the wheels and levers which moved it, as I have written, as though it had been a lady's lorgnette.

We had been talking much of La Place's famous nebular theory (now widely accepted, though largely modified and expanded since his day), and Professor Campbell deftly swung the vast telescope upon the nebula in Orion and bade me climb again into the observing chair. That marvellous object of the heavens came in full sight, defined with exquisite precision, as it could be in no other place and with no other instrument. I saw in the well-known region of "Beta, Orionis," the vast separate system of an outlying universe clearly mapped; a fleecy, irregular, mysterious, windy shape to the eye, its edges whirled and curled like those of a storm cloud, with stars and star clusters standing forth against the milky white background of the nebula, as if diamonds were lying upon silver cloth. The central star, which, to the naked eye or to a telescope of low power, looks single and of no great brilliancy, resolved itself, under the potent command of the Lick glass, into a splendid trapezium of four glittering suns, arranged very much like those of the Southern Cross. At the lower right hand border of the beautiful cosmic mist there opens a black abyss of darkness, which has usually the appearance of an inky cloud about to swallow up the silvery filagree of the nebula, yet the great glass filled this up with unsuspected worlds. When the photographing apparatus is fitted to it these all become clearly pictured. I had seen at Harvard College Observatory, under the gifted hands of Mr. Pickering, that fascinating operation by which the black spaces of the sky are made, in turn, to yield up their

secret of hidden suns and systems to the sensitized collodion film at the eye-piece of a telescope; and similar operations, with a view to map out the visible universe are constantly in progress at Mount Hamilton. It was necessary from time to time to raise the sliding seat on the ladder in order to keep this glorious prospect of Orion's nebula in the field, but the lateral motion was easily governed by the wheel moving the dome. I understood Professor Holden's view to be that we were beholding, in that almost immeasurably remote silvery haze, an entirely special system of world and clusters, apart from all others, as our system is, but inconceivably grander, larger, and more populous with suns and planets and their starry allies.

Next, we lightly turned the far-sighted giant of Mr. James Lick to Sirius, and held that superb star fast in its field—a white jewel of the darkness, incredibly clear, burning and brilliant. Yet those blinding rays by which it thus flashed its glory to our eyes had left the star's surface many years ago, and what we saw was but the light of Sirius emitted somewhere about 1875, so that for all our feeble senses could tell, the orb might be extinguished long after we should still continue to seem to behold it. Of course, even to the clear Cyclopean eye of James Lick's telescope, the fixed stars still remained what they always remain—mere points of light. No more could be made of them, even with such a prodigious power, than if they had been pin-holes pricked in the mantle of the night. But "she"—as Mexican Jack always called the monstrous instrument—does wonderful work with the planets and with the moon—the surface of which "she" is gradually transforming for us into something like an Ordnance Map, as regards detail and precision. "She" also renders the Mount Hamilton Observatory very strong in spectroscopy, which is diligently pursued on the Californian peak, and by means of this wonderful secrets are wrested even from far stars like Algol in Perseus. When one bears in mind the prodigious distances of the celestial ocean these feats of astronomy magnificently exalt the dignity and demonstrate the power of man's intellect. It has been computed that our sun, which looms so large for us, would be for an observer on the nearest fixed star no plainer to behold than to our own eyes an eagle soaring

at an attitude three times as great as the distance of Japan from New York! How little we are—and how great!

We turned the massive telescope from region to region of that "blue Pacific of infinity." At each new star-scope I heard, with an advantage and delight never to be forgotten, the elucidations and conclusions of the learned and courteous savants who took so much kindly interest in my "intelligent ignorance." Quite a long and lively discussion arose when the huge reflector was levelled at the new and astonishing star lately appearing in Auriga, which has blazed up so quickly and flickered into dimness again. They were watching and carefully measuring its variations of lustre, at Lick, comparing it night after night with Polaris, by exposures ranging from two seconds to one hundred seconds. It was Professor Holden's opinion that we were gazing there, amid the jewelled labyrinths of the Charioteer, upon a world of fiery ruin, flaring to its utter destruction; all its elements melting with heat unspeakable; all of its live things, if it possessed any, scorched to a white annihilation. My most erudite and kindly friend was inclined to be pessimistic at the spectacle.

"See!" he said, "it is to this that all stars and systems—let alone planets and asteroids—must come at last. Can you find much ground for your optimism in such a sight?" I, however, was obstinate in my faith—that destruction is reconstruction and that all endings are only beginnings. "Let the great Mother," I answered, "cast her condemned or discharged materials into the crucible of change, and work them up to fresh miracles of beauty and evolution. Flame, and fury of liquefaction, and elements bubbling in the furnace of stellar collision are only terrible to us because we think of them from the point of view of a burned finger, or the boiling range of Fahrenheit. To angelic intelligence the process may be gentle and pleasant to witness as the weaving of white satin. We talk of angels as ascending and descending in interplanetary space, where, nevertheless, the temperature must be 500 degrees below zero! Who thinks of them as wearing overcoats and blankets? I am not disconcerted by your world on fire."

Whereupon Astronomy smiled indulgently at Poetry.

UNSUSPECTED SOURCES OF FAILURE.

W. LINDSAY.

THERE can be very little doubt that by far the great proportion of the failures that occur in dry-plate work are attributed to wrong causes, and that, in very many instances, the poor platemaker or some equally innocent individual receives the blame that is really due to the carelessness of the operator. This happens not infrequently even when the operator is an old and experienced hand; but, undoubtedly, most such cases are to be met with in connection with beginners, whose knowledge of photography is not yet sufficiently extensive to have taught them how easy it is to err.

Photography has now become so extremely simple and easy a process that, to the average amateur, it is impossible to conceive how he can possibly go wrong, at least in the merely mechanical details of manipulation, although he may, perhaps, recognize the possibility, if not the probability, of there being at first some little difficulty, or at least something to learn, in development. But whether novice or veteran is the more really blameworthy it is impossible to say; the first errs from want of knowledge, the latter in spite of it, and he should therefore, perhaps, be deemed the greater sinner.

Several cases, serious, comic, and instructive, have recently come under my notice, and a narration of one or two may, perhaps, serve to impress upon some of your readers the folly of coming to too hasty a decision in such matters, and, above all, of recognizing the possibility that they may themselves be in fault, and thoroughly sifting the matter before laying the charge on other shoulders.

In one case, which promised to be a rather serious one, and possibly to lead, if not to a lawsuit, at least to "strained relations" between two hitherto old friends, I was asked to arbitrate on the subject of the quality of certain plates, a large number of which had been supplied through a dealer to a customer who condemned them as worthless. The maker, on testing a sample

returned to him for the purpose, pronounced them all right, and declined to take them back; the dealer, on testing the plates, moreover, found them free from fault, but, as they were an uncommon and unsaleable size, he could scarcely agree to have them on his hands as useless stock. In the dilemma, I was appealed to to give an opinion on the plates, and, on trial, pronounced them good in every respect.

The customer accepted the decision; but, though he went earnestly to work to discover where he himself was wrong, so many verdicts being against him, his compliance was of that character that left him "of the same opinion still." By chance I happened to be at his place of business when the matter of the plates was mentioned, and it was proposed to make a joint trial of them, and certainly they turned out all that he had alleged them to be from the first, foggy and hopelessly bad. The fog extended over the whole plate, even to the margin representing the rebate of the dark slide, and that fact, in conjunction with a careful examination of the camera, proved that the latter was not in fault, while there was no reason to lay the fault to the dark-room. I accordingly carried away with me two or three plates from the same box to try in my own dark room, when, strangely enough, they again worked without the slightest blemish.

Returning to the charge, another plate was exposed in the professional studio, and that, together with a second that had not been exposed, were placed together in the same developing dish, when the exposed plate came out precisely as previous ones had done under the same circumstances, while the unexposed one remained perfectly clean. Here, at least, proof was positive that the fault lay in some way with the exposure. The camera, as I have said, appeared perfectly light-proof; but, to place that beyond dispute, a plate was cut in half, one-half being kept in the dark room without exposure, the other placed in the dark slide, with a portion protected with opaque paper, and exposed as before. On developing the two halves, the unexposed portion was, as before, perfectly clear, the other completely and equally fogged.

Now it became evident that, while the fog arose in the camera, it was certainly not in front of the plate, but behind; so a plate was placed in the slide—a single one with hinged door—and one-half of it covered with opaque paper placed behind it. As a matter of form the plate was exposed in the camera, and on development the protected half proved perfectly clear; the other badly fogged, as on previous trials. On carefully overhauling the dark slide, it was discovered that from shrinkage—no doubt caused by the protracted dry weather—the back door of the slide did not lie closely in the rebate, and light leaked in nearly all round the edge of the plate, and so the mystery that had so nearly caused much unpleasantness was explained.

In another case a batch of plates was condemned in a very similar manner, the fault in this case being that many of them—sometimes three or four, or even more, in a box—were marked by a diagonal line of fog across the middle of the plate, one side being clear. In other boxes the whole of the plates might be perfect. The theory formed by the victim in this case was that a light had been taken into the drying room while the plates were in the drying racks, and that some of the batch had thus got fogged in this partial manner. The theory was ingenious, but it was shown that at the particular factory it was impossible. It turned out in this case, after a long series of investigation, that the fault was again due to a defect in the camera, aided by circumstances. The camera was one of the reversible-back pattern, and at one corner of the reversing frame, that which was at the right-hand top when the plate was in the upright position, admitted a leak of light, at least when in that position; for when placed in the horizontal direction, in which case the defective corner was at the bottom and did not get the benefit of the direct light, the diagonal streak of fog did not occur. This discovery, of course, put a very different complexion upon the drying-room theory.

Another case in which the blame was sought to be fixed wrongly on the camera—not, in this instance, on the platemaker—gave a good deal of trouble before it was accurately diagnosed. The defect took the form of an irregular blur of fog, occurring

only occasionally, but always in the same position on the plate. It was not sufficiently well defined to give the idea of being caused by any minute aperture in the camera front acting as a "pinhole," less still of its being caused by a perforation at the back of the slide—this also being a single slide. However, its always falling in exactly the same position proved that it was caused mechanically by some internal defect in the camera. Examination of the slide with a plate in position showed that the "blur" fell just where the spring pressed upon the back of the plate, this spring being of "blued" steel, nicely rounded at the extremity. Further investigation showed that when the camera was employed in a certain position out of doors, for portraits or groups, the light from the sky, entering the lens, passed through the plate, and was reflected back by the curved and polished extremity of the springs. The application of a little dead black varnish in this instance removed the trouble.

As an example of the comic side of matters, I may conclude by mentioning an incident that occurred to myself, and which for a time presented all the features of an inexplicable mystery. A friend who was just entering on the novice's stage brought to me for my opinion a new camera that he had had offered to him, and of course the instrument had to be tried. This was done by each in turn taking the other's portrait, the slides containing the two plates being then taken into the dark room for development. One plate, however, turned out to be hopelessly fogged, while the other gave not the slightest trace of an image. The slide was refilled and the exposures repeated, but with a precisely similar result. That one or other of us should have omitted to draw the shutter once would not have been remarkable, but that it should be repeated after the contingency had been mentioned was scarcely likely; but even then it would not account for the fogging of the other plate, and seemed too extraordinary a coincidence that twice in succession a good plate and a bad one should be placed in the slide, and the good one in both instances escape exposure.

A third pair of plates were placed in the slide, and for the third time one of them developed a mass of dense fog, while the other was quite innocent of exposure, and the situation began

to be decidedly interesting if a little exasperating. It was my friend's plate that had escaped exposure in each case; so, after sitting for the fourth exposure, determined to solve the mystery, I placed my hand under the focusing cloth in order to be perfectly certain that the novice understood what drawing the shutter meant. He proved to be quite capable of performing that simple operation in a fashion, but where he had erred was in drawing *the wrong one!* In fact, one of each pair of plates had been exposed twice, once in the camera and once out of it, while the other was not exposed at all.

—*British Journal of Photography.*

SENSITIVENESS OF PHOTOGRAPHIC PLATES.[1]

PROF. GEORGE W. HOUGH.

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THE extensive use of photography in science, art and industry makes it desirable to know something regarding the sensitiveness of the plate employed for any specific purpose. The subject, however, is one of great difficulty, owing to the fact that we have not been able hitherto to secure a satisfactory standard of light with which to compare plates.

The method now in use by the makers of commercial plates, to indicate sensitiveness, is far from satisfactory, since there is no direct relation between the numbers used by the same maker, and still less when the plates of different makers are compared. The number twenty-five of one maker may indicate greater sensitiveness than the number fifty of another; and in general the numbers do not convey any definite information as to the time of exposure required. It seems to me that it would be an important step in advance if the makers of commercial plates would at least adopt a uniform system in indicating the sensitiveness, so that the numbers (even if arbitrary) would in all cases have the same meaning.

[1]Read at the Congress of Photographers.

It appears now well-nigh impracticable to use sunlight as a direct standard for illumination, unless a standard plate is adopted for comparison. But I think it is not impracticable to employ artificial light which will give an absolute measure of sensitiveness for the light employed. Artificial light, however, whether it be from the burning magnesium, the electric lamp or the flame of a candle, does not have the actinic properties of sunlight, and hence different brands of plates, which have the same sensitiveness for any particular artificial light, may be quite different for sunlight.

It seems to be tacitly assumed, however, by most writers, that the standardizing of a plate in one particular artificial light is all that is necessary. On the contrary, the problem is only partially solved.

During the past ten years I have made hundreds of experiments on the relative sensitiveness of plates in candle-light and daylight, from which it is concluded that the plates of different makers do not necessarily hold the same relation of sensitiveness for the two kinds of illuminations. In the standardizing of plates, where the minimum visible is used as the measure of sensitiveness, we meet with a peculiar phenomenon, which may greatly impair, if not entirely vitiate, our results. I refer to the effect of extraneous light received by the plate in its manipulation.

When the wet collodion plate was in general use it was imagined by many that the plate became more sensitive if subjected to preliminary or supplementary exposure. In 1884 I experimented on an emulsion plate, and found no change in sensitiveness due to preliminary exposure, and hence inferred that the only effect was simply fogging, which would cause the collodion or emulsion plate to start more quickly in development. I subsequently found that this view of the subject requires some modification. The reason why no difference was noticed in 1884 in the case of preliminary exposure was undoubtedly due to the face that the plate had already received, in the process of manufacture, all the preliminary exposure it would stand. In the early days of commercial emulsion plates, they were frequently

fogged so badly before they reached the consumer as to be greatly impaired, and sometimes practically valueless.

Last year in making experiments on the actinic effect of ordinary red glass used for dark-room illumination, employing a ten-candle lamp, I found such discordant values for different pieces of the same plate when exposed and developed under similar conditions as to call for an investigation of the cause. The statement has frequently been made that the same plate, in its different parts, indicated great variations of sensitiveness. This idea is so directly opposed to every-day practical work in landscape and portrait photography as to seem well-nigh incredible. In fact, if it were a common occurrence one could not make a correct negative. It occurred to me that the abnormal results which I obtained were in some way connected with the manipulation of the plate during the exposure and development. I accordingly made the following experiment: A Seed No. 26 4 by 5 plate was cut in three strips, using a very feeble light during the operation. Strip No. 1 was kept in the dark; No. 2 received a preliminary exposure of two seconds in the dark-room at 1 foot distance from the red glass window; No. 3 received a supplementary exposure of two seconds in the same way. The three pieces were successfully exposed in the sensitometer to the light of a candle for ten seconds, placed at 10 feet distance. They were then developed together in total darkness. Strip No. 1 printed the figure 40. Nos. 2 and 3, 8 and 10 respectively. This experiment indicated that when a plate received a preliminary or supplementary exposure, it appeared to be about five times more sensitive.

I had observed a similar phenomenon in the case of wet collodion in October, 1891, but attached no importance to it at the time.

The most sensitive wet-collodion plate which I have used requires an exposure of 2.5 seconds for a naked candle at one foot distance to make a legible impression, but by a suitable amount of preliminary or supplementary exposure the time may be reduced to 0.3 second, indicating an apparent increase in sensitiveness of eight times. A great many experiments have been

made with various kinds of emulsion plates, in candle-light, feeble daylight and through red glass, all giving similar results. In order to get the maximum effect, the plate should receive all the preliminary exposure it will stand without prod
fog. If there is too much fog the numbers will be buried under it.

This peculiar behavior of photographic plates in light of feeble actinic energy explains very clearly why experimenters have got such discordant results in attempting to standardize them. The phenomenon probably disappears when strong daylight is used; for we know by experience that preliminary exposure does not make a plate more sensitive when used for a landscape negative. The subject may, however, have an important bearing in astronomical photography, where the light has very feble actinic energy, as in the case of stellar photographs.

The following appears to me to be the explanation of the apparent increase in sensitiveness, due to preliminary exposure. A photographic plate may receive a certain amount of light and when placed in the developer show no visible blackening of the film. This fact is apparent in using a slow plate like wet collodion. A plate, therefore, which has had a certain amount of preliminary exposure may be under such strain that a small amount of additional exposure will enable the developer to reduce the bromide of silver. Under this conception the actinic effect should be measured by the intensity of the light multiplied by the time, plus a constant; the constant being a function of the original sensitiveness. In landscape photography, the constant would be such a small interval of time as to be entirely lost.

In view of what has just been stated regarding the behavior of plates in light of feeble actinic energy, it is readily seen that our present method of standardizing plates, by using the minimum visible, is open to very serious objections, owing to the difficulty in manipulating plates in the dark-room. With the more rapid commercial plates a single second exposure before the developing lamp is sufficient to materially modify the result.

After considerable thought on this subject, it has occurred to me that we can most readily get a uniform system for designating the sensitiveness of plates by adopting an arbitrary plate as the

standard of reference, and making our compositions by daylight as well as artificial light. The wet collodion plate has frequently been suggested as a standard of reference; but it has been objected to on the ground that the sensitiveness would not be constant. As a matter of convenience, I presume a slow emulsion plate would answer the purpose better, since such a plate could be interchanged among the makers of commercial plates. By adopting such a method we would at least have a homogeneous system.

I have at different times determined the sensitiveness of nearly all the well-known brands of commercial plates for daylight, candle-light and for red glass. My normal collodion plate is used as the standard of reference for daylight compositions.

The following are some general results for sensitiveness in daylight:

Wet collodion	1
Slow lantern-slide plate	10
Rapid emulsion	120
Most rapid plate examined	220

For candle-light, or any other artificial light, the absolute time required to make a legible record can be obtained. For a naked candle at one foot distance the following are some of the results:

Normal collodion	2-5 seconds
Slow lantern-slide plate	1-10 seconds
Rapid emulsion	1-150 seconds
Most rapid isochromatic	1-500 seconds

Photographing an Active Volcano.—Letters received from Professor Benjamin Sharp, of the Academy of Natural Sciences, who recently left in company with Professor Libbey, of Princeton, for an exploring tour of the Sandwich Islands, gives the first report of the work accomplished. Soon after arriving at Honolulu Professor Sharp says that they have examined the great crater and obtained a number of valuable palæontological specimens. They have also made many scientific investigations regarding the curious relics, and have collected many photographs which will be of immense service to the academy. From the letters it is evident that the explorers expect to start for home some time next month. They will reach this city about December 1st.

THE PHOTO-MECHANIC PRINT PROCEDURE TO THE YEAR 1893.*

JACOB HUSNIK.

Imperial Professor and Member of the Art Institute of Husnik & Hausler, Prague.

THE photographic deep-print or copper-plate-print is represented through methods which are known under the name "Heliogravure," and already stand on the highest grade of developement. It is the same with the "Lichtdruck;" both processes do not show much improvement since 1870, only in the "Heliogravure," the secret and well guarded methods of Dujardin and Baldur of Paris, have been brought to light by a Bohemian by the name of Karl Klic of Vienna. The entire process consists of putting fine asphalt powder equally on a polished copper plate, to be heated, and to develop on the plate a pigment picture, which has come out through illumination under a positive; this is therefore etched with a solution of chloride of iron. Goupil, in Paris, has practiced for a long time a process which requires much retouching. He has added glasspowder to gelatine and prepared his own pigment papers, which he lighted (under negatives) and exposed on silver copper-plates, and electrotyped the dry relief. The same process has been cultivated by Schreiber, in Vienna, in 1873, only he took a grained skin of gelatine, which he put between the negative and the pigment paper, and very good half-tone plates are yet in the Imperial State Printing Establishment in Vienna. Dr. E. Albert, in Munich, produced lately a grained gelatine relief with the well known "Runzelgrain" of the gelatine (Pretschmanier); the same process was practised in 1870 by Rodriguez and Leipold in Lisbon, but with no success. Obernetter, in Munich, has used a process for many years, which consists of a collodion picture out of iodine of silver, transferred on a copper plate; the silver will reduce itself and etch the copper.

There are now experiments made with a new deep print process. A developed pigment relief in wet collodion, is powdered with the finest asphalt powder; after drying, the powder is removed, and it remains a grained gelatine relief, which is electrotyped.

*Read at the Congress of Photographers, Chicago, August, 1893.

The photo-mechanic process for printing presses has made great headway lately, and pen drawings have reached the highest stage of perfection. Half-tone originals must be laid out in lines first, and this is done with the aid of transparent Rasterplates or nets, which have been perfected of late.

The writer of this built a ruling machine four years ago, and obtained faultless nets drawn on glass, which are to be glued or cemented between two glass plates, and which are perfect, and in use in Prague, by Husnik & Hausler. Loewy, in America, has the same cemented and perfect nets, and they are generally used. Meisenbach, in Munich, was the first man who practiced this method with success; after him came Angerer & Goeschel, in Vienna, Goupil, in Paris, Husnik & Hausler, in Prague, and Riffahst, in Berlin. The writer of this has perfected the collotype, and samples are found in all public magazines. At present experiments are made to print three or more colors on the printing press, and particular merit is due to Dr. Vogel in Berlin. His methods are exercised by Kurz in America, and Buchsenschein in Berlin. Up to date it is not yet perfect; there is need of the clear, green color, which now holds too much red.

My son, Jaroslaw Husnik, practical chemist, has greatly improved the photographic three-color print, and faultless pictures are the result, which the firm of Husnik & Hausler executes, and herewith sends samples for inspection; also the three clichés for the three ground colors, yellow, blue and red, with impressions, and other samples, have been mailed separately to your address.

DEAR SIR: We take the liberty to notify you herewith that we have shipped to your address to-day, an article by Prof. Husnik, prepared for the World's Congress of Photographers; also, separately, the necessary explanation, the gelatine reliefs and the clichés for the three-color print.

We mention that we have enclosed proofs of the gelatine reliefs which substitute the make-ready on the cylinder of the bookpress. In relation to the three-color we will say that we are prepared to execute this process on a large scale, and are willing to sell to American studios, if desired.

In Europe our process in three-color print has met with great success, and we are busy filing orders for this reproduction. Our process will, without doubt, very much interest the American continent, and we would rejoice if you should mention it in the World's Congress.

We will also mention that this process consists of three photo-negatives, one for yellow, one for blue, and one for red, transferred on zinc and etched. This is, as you will see, very simple; there is no need of extra help, and we believe it to be much superior to those of Mr. Kurz, of New York, of which the proofs did not satisfy us at all.

Our gelatine reliefs, as a substitute for the make-ready on the cylinder, which we mentioned in Prof. Husnik's article, are also in great demand, and would prove successful to American printing establishments, as the work can be done quickly and effectively.

It would be very interesting indeed, if you would have those clichés of the three-color print, which we have sent you, printed in Chicago, with the use of our gelatine reliefs, also enclosed; and we would recommend to print the yellow color first and the red last. We have no doubt that this proof would be regarded with high consideration by the Congress.

Very respectfully,

HUSNIK & HAUSLER.

Photographers have lately introduced a pencil for use in retouching negatives which is rapidly revolved by a small electro-motor, so that the point of the pencil spins, and is rubbed on to any spot by simply moving the point gently over in any desired direction, thus doing away with the necessity for the tiresome, confined motion of the operator's hand. A German idea in this line, which possesses merit, consists in fixing the negative of the photograph in a frame, which is vibrated rapidly by an electro-magnetic apparatus. Mention is made, also, of a still later device of this kind, of English origin, in which the pencil point is very rapidly vibrated through an exceedingly small stroke by a simple electro-magnetic contact breaker, so that the pencil has only to be guided by the operator while the electro-magnet performs the necessary rubbing in an exceedingly rapid rate—about 2000 strokes per minute.

MR. FREDK. E. IVES' NEW VENTURE.

THE prolonged absence of Mr. Fredk. E. Ives has been the source of much comment among his many friends in Philadelphia. The following article from *The Photographic News* solves the enigma. It has been reported that Mr. Ives intends to make England his permanent residence. Personally we trust that there is no foundation to this rumor. However, be it as it may, we heartily wish Mr. Ives success in his new venture, be it temporary or permanent. One thing is certain, that our British cousins can learn much in the reproduction processes from Mr. Ives.—The *News* states:

The new road which runs from Charing Cross to Oxford street contains many handsome buildings, prominent among which is Northumbria House, the home of the Swan Electric Engraving Company. To these spacious premises we lately paid a visit, and were shown over the workshops by Mr. Cameron Swan, and Mr. Wm. H. Ward (late of Marcus Ward & Co.), two of the directors, and by Mr. F. E. Ives, of Philadelphia, who for some time past has been superintending here the production of printing blocks by a new process which he has elaborated and perfected. A glance round the reception room and offices suffices to show that no pains or expense have been spared in the decoration and general fittings of this large establishment, which is fitted throughout with the electric light—both the arc and incandescent systems being in evidence—and is heated in every part by hot water on Keith's system.

Ascending to the top floor we were first shown the studio and dark rooms devoted to the photogravure—or, we should say, the electro-gravure process. In the glass-room is a huge vertical easel which travels on rails in front of a gigantic camera, the purpose of which is to bear any picture or other work of art which is sent in to be reproduced as an electrogravure. And that the first artists recognize the beauty and value of this method of reproduction is evidenced by the many oil paintings which we saw in another room—paintings by some of our first men which have

adorned the walls of the Royal Academy and other exhibitions. We noticed in the studio that dark curtains could be drawn in front of the camera, in order to destroy those tiresome reflections which are so obstructive when copying oil paintings. At one side of the studio is a dark room for moderate-sized pictures, while at the end is another for large work, which, when occasion requires, becomes itself a camera. Through a partition separating this room from the studio projects a big lens, and upon entering the room we find another travelling easel, with fittings, to which a sensitive plate of any size can be clamped. Exposure is made either by daylight or electric light, and the negative can then be detached from its support and immediately developed.

Passing by a small room used for retouching purposes, and giving a glance at the special platform on the roof used for printing frames—not an inch of space is wasted here—we are next shown a large box-like structure, ventilated in a special manner, for the drying of carbon tissue. Adjoining this are carbon developing tanks and apparatus in which the exposed tissue is squeeged.

It must be here made clear that the Company are engaged in carbon printing generally, and not only in so far as it is required in their own work. Originally the invention of their senior partner, Mr. Joseph Wilson Swan, it enters into the electro-gravure production, and, to a less extent, into the block-making.

On the floor below we find ourselves in a large apartment which is devoted to the production of the negatives for the "Swan-type" blocks. Here are cameras of all sizes, the lens of each furnished with a mirror (silvered on surface); for the negatives produced must be reversed, and the mirror is the most convenient method of accomplishing that end. Each camera is complete with its vertical easel and its electric arc-light. This latter is of the Brockie-Pell type, modified so as to work with an alternating current. The switches for these lamps are on an adjoining wall, so that the workmen in attendance can turn them on and off as required. On this floor are dark rooms without number, and we watch with some interest the development of a negative, which, however, does not reveal the delicate network it has received in

the camera until it it is examined with a strong magnifier. One little dodge we noticed here which seemed of great utility. At the side of the developing sink was a basin-like vessel, fitted with a ground-glass screen across its mouth, and an electric light within it. Over this light screen the operator could hold his negative after development, so as to judge of its quality, and intensify it if necessary. The wet collodion process is used here exclusively.

Descending to the next floor we find it devoted to printing from the negatives on to a peculiarly sensitive film, on hard, rolled copper. And what ponderous things are these printing frames, with plate glass an inch in thickness to resist the pressure brought upon them by powerful screws at the back. Exposure to electric light follows, and the copper plate is ready for development, which eliminates the sensitising material not rendered insoluble by light action. Next the copper plate is dried, and the preparation upon it is so stable that it will resist acid without any rolling up or similar treatment. The etching, therefore, immediately follows, and the photo-chemical part of the process is complete.

But to see the blocks made ready for the printer we must proceed to the basement, where there are numerous machines, whose names we know not, for cutting out, polishing, squaring, and other treatment of metal. Suffice it to say that here the metal plates are cut, squared, and attached to type-high wooden blocks, so as to fit them for the printing press.

A peculiarity of this department is that each machine is worked by its own electro-motor, and these receive their energy from a gas engine and dynamo. The electric power station of the Swan Electric Engraving Company is situated at a distance of some two hundred yards from their main building, and it appears miraculous to the uninitiated in electrical matters to find that all the power used by the Company travels along two small wires in the form of electricity, and is re-converted into motive power in the main building, to drive the machinery, printing presses, etc.

Another branch of the work carried on at Northumbria House is the "steel-facing" of copper plates, which is an important part

of the electro-gravure process—every plate being covered with an electro-deposit of steel, of extreme thinness, to obviate wear in printing. A special dynamo and electrical apparatus designed for the purpose performs this delicate operation.

We have not space to describe at length the various forms of printing presses which are at work in another department of this large business-house. The blocks and electro-gravure plates are not only made here, but they can also be printed from here if required, and the innumerable specimens handed to us prove that the work is of first-class character.

A Recent Find of Chaldæan Art.—Of late years archæologists have been giving close attention to the study of the ancient Chaldæans, in the endeavor that something more than legends may be known of this, one of the earliest of races, and the progress made is remarkable. Researches have brought to light numerous works of art made some 3800 years before the Christian era, the masterly execution of which show a high degree of civilization, and other finds indicate that this excellence was only attained after centuries of effort. Among the latest discoveries is by M. de Sargec, at Telle, of a monument built by order of E-annodow, King of Sirpoula, son of A-Kourgal and grandson of Our-Nina, one of the oldest Chaldæan kings yet known to us. Among the scenes carved on this monument is the representation of a funeral after a battle, or a thanksgiving after victory. The king himself is shown in the act of piercing with his lance a defeated enemy, and in another place in his chariot charging the flying warriors. On another face of the monument is sculptured apparently a mythological character. It is of gigantic size, with naked body, and in his hands he carries a massive club and a curious instrument, the figure of which is an eagle, whose claws rest upon a lion's head. Beside him is an immense net, in which crawl, in all possible attitudes, trying to escape through the meshes, a number of naked men.

Not Positive.—Customer—Do you suppose you can take a good picture of me?

Photographer—I shall have to answer you in the negative, sir.

The Editorial Dropshutter.

Light-Proof Films.—The charge is often made that there is nothing new in photography. On one of our trips to an interior town in Pennsylvania, we found the following advertisement in the local paper. "Light-proof Films" is certainly very rich:

THE AGE CAMERA.—"The Latest and Most Wonderful Invention in Photography."—The Age Camera is made and finished in the very best manner, with polished cherry case, and has an achromatic lens, which is set to take pictures at any distance from eight feet upward; no "focusing" required. All you have to do is to *aim the camera, push the spring* (which is always set), and *turn the key*. After doing this 12 times the film cartridge is taken out—in daylight—and is ready to have the 12 pictures finished. A fresh cartridge for 12 more pictures is then inserted. Extra cartridges are 60 cents each.

With this camera any man, woman, or child can take good pictures of anybody or anything anywhere the equal of any $25 camera in the world.

No Dark Room or any practice is required, as the camera is loaded in broad daylight by dropping in a *Light-Proof Film Cartridge*, and these cartridges can be sent by mail to the factory, or taken to any photo-goods dealer or photographer to have the pictures finished; or you can finish the pictures yourself.

"Everybody should have one." No matter if you have a dozen other cameras. This is the latest wonder in photography, and just the thing to slip in your gripsack when traveling.

The price—$7.00—barely covers the cost of manufacture and three months' subscription to *The Age*, which can be sent to any address. The Age Camera is the equal of any $25.00 camera in the market. Come and see it! One Age Camera, as above, loaded with *Light-Proof Film* Cartridge for 12 pictures, with Instruction-Book, will be sent in wood box by express, and *The Age* will be sent to any address for three months. Next.

California Camera Club.—The Annual Pay Exhibition for the purpose of raising funds to enable the club to better fit up their rooms and for the purchase of new and additional apparatus for the use of the members, was held in October last. The exhibition this year was conducted by the regular Exhibition Committee of the club.

A Valuable Find.—A hidden treasure was unearthed in Washington which promises to be a valuable addition to the relics of the war. It was discovered by J. Watson Porter, an itinerant photographer, in a house on Pennsylvania avenue, between Twelfth and Thirteenth Streets, N. W. It consists of a collection of rare photographic negatives of the war times. Included in the collection are plates, taken from life, of Abraham Lincoln, J. Wilkes Booth, Charles Sumner, Edwin M. Stanton, Salmon P. Chase, Vice-President Henry Wilson, Horace Greeley, General U. S. Grant, General George B. McClellan, Rev. Henry Ward Beecher, Prof. Agassiz, and a dozen other persons of almost equal importance in the history of the land of the Stars and Stripes. The above negatives were shown a *Post* reporter by Mr. Porter, who picked them almost at random from a collection of hundreds of cob-web covered and dirty negatives, which, through Mr. Porter, had for the first time in more than a score of years seen the light of day.

While this batch was being looked over Mr. Porter pulled out another box, which contained negatives still more valuable. There was a copy of the old Dunkard church near which the battle of Antietam was fought. This negative was taken in 1863, before the battle. The very next plate was the only one taken from life of the hanging of Mrs. Surratt at the Washington Arsenal. There was one of the navy yard taken in 1863; another of the old Baltimore and Ohio depot, where so many stirring scenes were enacted during the trying war times; one of Pennsylvania avenue, between the Treasury building and the Capitol, as it looked in 1861, and still another of the Marine Barracks, taken in 1863, and many others equally interesting.

That this collection could have been for so many years hidden and neglected in the heart of a city like Washington is remarkable, but the collection tells its own story. The entire lot numbers between five and six thousand plates, more than half of which are likenesses of persons either celebrated or notorious at the time they were pictured, or who have since gained distinction. Hundreds of them are of officers and soldiers of the armies of the Cumberland and Potomac, and others of naval officers and Federal employes of prominence.

Flash-Light System.—Williams & Shepard, of San Francisco, Cal., have issued a set of elaborate instructions for setting up and working the Williams system of flash lighting. By this system some wonderful results have been obtained, as are shown by specimens in our publication office. Blitz-pulver is used exclusively as an illuminant with the Williams system.

A Photographic Outing.—Conspicuous among the fleet of excursion steamers, which followed the Vigilant and Valkyrie on October 5th, was the "photographic steamer" the Chelsea, which had been chartered by the Society of Amateur Photographers of New York and the Photographic Society of Philadelphia. This day, which proved an ideal October day, was all that the party could have wished for, the only drawback being that there was little or no wind. It was estimated that there were over one hundred cameras on board. These covered the whole range from a five-dollar Waterbury to the five-hundred-dollar outfit, including every size, style, and condition. Prominent among the participants were Joseph H. Burroughs, John Carbutt, Wm. H. Rau, Caspar W. Miller, Anthony W. Robinson, Frank B. Warner, Edmund Stirling, Randall T. Hazzard, Henry Paul Busch, Frank G. Cauffman, C. H. Clark, Eckley B. Coxe, D. R. Hanawalt, Joseph C. Roop, Frank S. Lewis, H. A. Lewis, Julius F. Sachse, David Milne, Francis F. Milne, Hubert A. North, Coleman Sellers, and Louis Taws, from Philadelphia, and Frank C. Elgar, Fred Vilmar, O. P. Schoen, R. A. B. Dayton, Miss S. M. Cory, Charles Simpson, Mme. M. Obry, S. S. Palmer, Dr. John T. Nagle, V. S. Roumage, J. S. Jacobus, Isaac Dayton, Dr. J. F. Wardwell, Dr. M. B. Feeney, C. F. Wetzel, W. H. Drew, G. W. Wundram, H. Constant, E. Wuestner, P. L. V. Thiery, from New York.

Triennial International Exhibition.—The Council of the Bristol and West of England Amateur Photographic Association announces that the Triennial International Exhibition of photographs, apparatus, appliances and processes, is to be held in the Galleries of the Academy of Arts, Queen's Road, Clifton, Bristol. It will be opened on Monday, 18th December, 1893, continuing open till Monday, 22d January, 1894.

Apart from photographs for competition, the Council will esteem it a favor if those who have any interesting examples of the history and progress of photography will kindly lend them for exhibition.

Especial care will be bestowed on the hanging, so that all pictures shall, as far as possible, be done justice to, to facilitate which, the whole of the extensive galleries above referred to have been retained.

All communications must be addressed to the honorary secretary, F. Bligh Bond, 36 Corn street, Bristol; and all pictures intended for exhibition must be sent carriage paid, to arrive not later than December 1st, 1893, addressed—The Honorary Secretary, International Photographic Exhibition, Academy of Arts, Clifton, Bristol.

The Seventh Annual Joint Exhibition under agreement between The Society of Amateur Photographers of New York, The Photographic Society of Philadelphia, and The Boston Camera Club, open to all photographers, will be held by The Society of Amateur Photographers of New York, at the Galleries of The American Fine Arts Society, 57th street, near Broadway, New York, from the 16th to the 28th of April, 1894. Entry forms can be had by applying to the committee. Address: 113 West 58th street, New York.

Exhibition Committee: T. J. Burton, R. A. B. Dayton, R. L. Bracklow.

Next.—Oscar Wilde, the king dude of civilization and the jungles of Africa as well, is reported to be not in favor of "butcher shops."

He says they do not harmonize with æsthetic principles, and should be put under ground, out of sight, and the meat photographed. When customers want to buy, they can ask for photographs of the best chops and steaks, and make their selection without offending their artistic eyes and noses. The æsthetic Mr. Wilde has probably never been to market, or he would know that it is impossible to choose a good chop or a good steak by a photograph. Photographs often have a way of flattering the subjects represented, and are incapable of informing the purchaser whether the meat is tender or tough, fresh or ancient. Mr. Wilde is a good deal of a poet on paper, but we imagine that if his cook should furnish his roast beef for him by photograph, there would be some fine old English expletives heard around the dinner table when he came to chew this photographic cut. Pictures of meat might do for a Barmecide's feast, but if the teeth are to be used the photograph will not answer as a marketer's guide. There are a good many things in this world that offend the refined and exquisite taste, and which delicate sensibilities might regard as better under ground than above it—such as donkeys, for instance—but what would become then of people like Mr. Wilde?

A Photographic Burglar.—Elmer E. Bletz, a photographer, was arrested in Lancaster, Pa., on a grave charge. It is alleged that he was found in the act of robbing the bed-room of Miss Amelia Hershey, at an East King Street boarding-house, and when discovered by another boarder, Miss Amelia Doerr, his face was partially concealed by a handkerchief arranged as a mask. He threatened her with violence if she screamed, it is alleged, but as soon as he left the house she gave the alarm, and the alleged burglar was soon captured and lodged in jail.

Photographic Hints and Formulæ.

In response to a call signed by a number of leading photographers of Philadelphia, a well attended meeting was held the studios of Messrs. Gilbert & Bacon. The claim of Mr. W. G. Entrekin under his patent on continuous ground was discussed, it being the unanimous opinion that his claim was not a just one, but unless vigorously contested might prove a serious menace to the trade. An organization was effected for the purpose of raising funds and securing evidence to contest the suit now pending against Mr. Bacon or any other suit on similar grounds that might be instituted, to which end the committee were authorized to issue the following letter to all manufacturers, sellers, and users of photographic backgrounds.

H. C. PHILLIPS, Chairman.

J. P. CHEYNEY, Secretary. WILLIAM F. BACON, Treasurer.

PHILADELPHIA, Oct. 25th, 1893.

DEAR SIR: William G. Entrekin has obtained letters patent from the United States of America dated February 3d, 1891, and No. 445805 for photographic background. Under the said letters patent, Mr. Entrekin claims that no one can use, what is known in our profession, as a continuous background, without infringing upon said letters patent. Mr. Entrekin has commenced suit against Mr. William F. Bacon, of Gilbert & Bacon, photographers of this city, to restrain him from the use of a continuous background. This suit affects not only Mr. Bacon, but every photographer in the country, as it is a well-known fact that if one Circuit Court of the United States finds in favor of the patent, all of the other Circuit Courts will follow the ruling, and enter a decree enjoining the use of the patented improvement. We have therefore considered that every photographer in the country was equally interested with Mr. Bacon in defending the suit against him. The photographers of Philadelphia have organized to contest the said patent, and we would therefore request that you contribute so far as you deem you should, towards a fund that shall be used in defending the said suit. We would request an early response enclosing a check for your contribution, drawn payable to the order of W. F. Bacon, treasurer, 1030 Chestnut street, Philadelphia, to whom all communications should be addressed.

Yours respectfully,

C. M. GILBERT, H. A. WEBB,
F. GUTEKUNST, W. D. H. WILSON,
A. E. MARIS.

Fluoreal is a new developer containing sodium sulphite, lithia in the proportion of 6 parts per 1000, and fluorescein, the function of the latter being to arrest any light waves of short wave length that may have penetrated into the developing room.—*Photography Annual.*

Paramidophenol.—Citric acid is one of the best solvents of this reducing agent. A solution of 100 parts of the acid in 100 parts of water at 17° C. dissolves about 97 parts of the paramidophenol. A satisfactory formula is:

Water	50 parts.
Paramidophenol citrate (conct. sol.)	1 part.
Sodium sulphite (conct. sol.)	4 parts.
Sodium carbonate (conct sol.)	5 parts.
Caustic potash (10 per cent.)	2 parts.

Or, for a weaker developer:

Water	150 parts.
Para-citrate	2 parts.
Sodium sulphite	50 parts.
Sodium carbonate	50 parts.

Use concentrated solution as above.

Lithia.—Satisfactory results have been obtained by the use as alkali of lithium hydroxide, which is readily prepared by the action of barium hydroxide on lithium carbonate.

Clearing Solution.—

Chrome alum	180 grains.
Potassium metabisulphite	2 ounces.
Water	20 ounces.

Instead of the metabisulphite 4 ounces of sodium sulphite may be used, with the addition from time to time of sufficient hydrochloric or citric acid to make the solution smell distinctly of sulphurous acid.

Carbon Paper is now imported by G. Gennert, of New York, in about one-half dozen colors, mainly, engraving black, sepia and brick red, colors which will probably be most in demand with the amateur trade. For the benefit of amateurs, the paper is cut in sheets and put up in dozen packages.

Double transfer paper and flexible support, and all the chemicals necessary to work this process, are also to be had.

Pyro Stained Negatives.—Five causes are given for the yellowing or staining of negatives developed with pyro: (1) An insufficient quantity of sulphite in the developer; (2) prolonged development of under-exposed plates; (3) insufficient washing before fixing; (4) insufficient fixing; (5) an exhausted hypo bath.

Literary and Business Notes.

PHOTOGRAPHISCHER ZEITVERTREIB. Dr. Herman Schnauss. Fourth Edition. 199 pages, with 133 illustrations. Ed. Leisegang, Dusseldorf, 1893.

It is but a trifle over a year ago that we reviewed the third edition of Dr. Schnauss' "Photographic Pastimes." So great has been the demand for the work that a new edition is already called for. The present edition is not a mere reprint of the former editions, but has been brought down to date, and shows how much innocent amusement may be obtained by the use of the camera and its accessories. The author shows conclusively that notwithstanding the high position occupied by photography in the arts and sciences, and its usefulness in the various industrial arts, and in portraying daily occurrences, that there is also a humorous side to photography. Only such experiments are given as require the least apparatus and the usual knowledge of photographic manipulations.

MICROSCOPES AND ACCESSORIES. — Bausch & Lomb Optical Company, Rochester, N. Y. Columbian Edition, 1893.

This catalogue of 138 pages, with 174 illustrations in the text, is the fourteenth catalogue issued by above celebrated firm of opticians. As the title indicates it deals mainly with microscopes, objectives, accessories, and microtomes. Considerable space is devoted to the apparatus for photo-micrography, which includes all requisites for bacteriological and laboratory work. The catalogue is in reality a reference book which should be in the hands of every photographic student.

PHOTOGRAPHY AT NIGHT. P. C. Duchochois, New York, 1893.

INDUSTRIAL PHOTOGRAPHY. By the same author.

Both received too late for this issue. Review will appear in our next.

RECENT PATENTS.

The following list of patents relating to the photographic interests is specially reported by Franklin H. Hough, Solicitor of American and Foreign Patents, No. 925 F St., Washington, D. C.:

505,813.—Camera. E. R. Bullard, Wheeling, W. Va.

506,109.—Photo processes, half-tone negative for. F. J. M. Gerland, Bayonne, assignor to himself and W. C. Hespe, Jersey City, New Jersey.

505,968.—Photographic back-ground. J. H. Titus, Tarentum, Pa.

506,025.—Photographic posing chair. J. Winter, Sr., Syracuse, New York.

506,343.—Photographer's changing and developing box. J. F. Snapp, Garza, Texas.

506,893.—Photograph displaying rack. T. E. Wood, Kalamazoo, Mich.